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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/592,813	06/13/2000	Philip Piro	1920/106	7669

2101 7590 03/26/2003

BROMBERG & SUNSTEIN LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER

LEI, TSULEUN R

ART UNIT	PAPER NUMBER
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2684

DATE MAILED: 03/26/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/592,813

Applicant(s)

PIRO ET AL.

Examiner

T. Richard Lei

Art Unit

2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Andrys et al (U.S. Patent 6,057,714).

Regarding Claim 1, Andrys teaches a field effect transistor mixer comprising:

a) a balun having a primary and a secondary, the primary coupled to a radio frequency signal input (Fig.1, RF balun 2);

b) a pair of field effect transistors, each transistor having a gate, a source, a drain, and a channel between the source and the drain, wherein i). the gates of the transistors are coupled to one another and to a local oscillator input (Fig.1, Mixer 4), ii). one of the source and the drain of a first of the two transistors is coupled at a node to one of the source and the drain of the other of

Art Unit: 2684

the two transistors, and the node is coupled to ground (Fig. 1, Mixer 4, 54 & 56), iii). the other of the source and the drain of the first of the two transistors is coupled to one side of the secondary of the balun and the other of the source and the drain of the second of the two transistors is coupled to the other side of the secondary of the balun (Fig. 1);

c). and an intermediate frequency signal output coupled to a point in the circuit path between the first and second transistors (Fig. 1).

Regarding Claim 2, Andrys teaches a mixer according to claim 1, wherein, at the node, one of the source and the drain of the second of the two transistors is connected to ground, and the node is coupled to one of the source and drain of the first of the two transistors by a filter (Fig. 1, Mixer 4, 54 & 56; Official notice: if the IF output is single-ended, instead of balanced as shown in Fig. 1, one node would be grounded).

Regarding Claim 3, Andrys teaches a mixer according to claim 2, the filter having a capacitor serving as a shunt at the frequency of the Radio frequency signal but not at the frequency of the intermediate frequency signal (Fig. 1, Mixer 4, 54 & 56).

Regarding Claim 4, Andrys teaches a mixer according to claim 1, wherein the local oscillator input is coupled to the gates via a capacitor so as to cause the transistors to be biased near pinch off (Fig. 1 Bias circuit 6; Col. 2, Lines 2-16).

Art Unit: 2684

Regarding Claim 5, Andrys teaches a mixer according to claim 1, further comprising a capacitance disposed across the balun secondary to tune the secondary (Fig. 1, 24; Col. 4, Lines 7-16).

Regarding Claim 6, Andrys teaches a mixer according to claim 5, wherein the capacitance includes a pair of capacitors connected in series, wherein the node at a connection between the capacitors is coupled to ground (Fig. 1, 24).

Regarding Claim 7, Andrys teaches a mixer according to claim 1, wherein the secondary has a center tap, and the center tap is coupled to ground (Fig. 1, 24).

Regarding Claim 8, see Claim 1 for Andrys teaching.

Regarding Claim 9, see Claim 2 for Andrys teaching.

Regarding Claim 10, see Claim 3 for Andrys teaching.

Regarding Claim 11, Andrys teaches a method according to claim 8, further comprising applying a capacitance across the balun primary to tune the primary (Fig. 1, 22; Col. 4, Lines 7-16).

Regarding Claim 12, see Claim 5 for Andrys teaching.

Regarding Claim 13, see Claim 6 for Andrys teaching.

Regarding Claim 14, see Claim 7 for Andrys teaching.

Regarding Claim 15, see Claim 1 for Andrys teaching.

Regarding Claim 16, see Claim 2 for Andrys teaching.

Regarding Claim 17, see Claim 3 for Andrys teaching.

Regarding Claim 18, see Claim 5 for Andrys teaching.

Regarding Claim 19, see Claim 6 for Andrys teaching.

Regarding Claim 20, see Claim 11 for Andrys teaching.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2684

Dobrovolny (U.S. patent 5,280,648) teaches a double-balance RF mixer.

Vice (U.S. Patent 5,799,248) teaches a quasi-double-balanced FET mixer.

Nice et al. (U.S. patent 6,144,236) teaches a super FET mixer.

Waugh et al. (U.S. Patent 5,060,298) teaches a monolithic double-balanced mixer.

Poulin et al. (U.S. Patent 6,278,872) teaches a frequency converter with improved linearity.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. Richard Lei whose telephone number is 703-305-4828. The examiner can normally be reached on 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on 703-305-4778. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-5403 for regular communications and 703-308-5403 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

TRL

TRL

March 18, 2003

Thanh Cong Le

THANH CONG LE
PRIMARY EXAMINER

TRLe

3/20/03